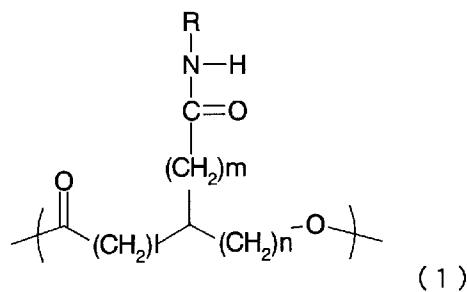


B. Claims

The following is a complete listing of the claims, and replaces all earlier versions and listings.

1. (Currently Amended) A polyhydroxyalkanoate characterized in that the polyhydroxyalkanoate comprises comprising one or more units represented by the chemical formula (1) in a molecule:



wherein R represents $-A_1-SO_2R_1$;

wherein R_1 is selected from the group consisting of OH, a halogen atom, ONa, OK and OR_{1a} ;

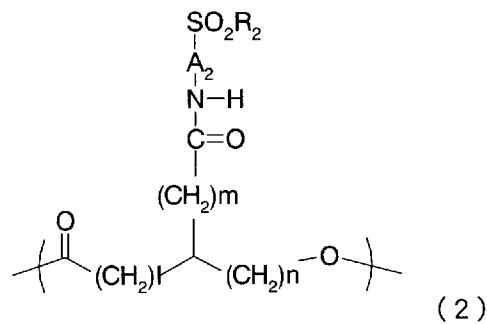
wherein R_{1a} and A_1 independently represent a group having a substituted or unsubstituted aliphatic hydrocarbon structure, a substituted or unsubstituted aromatic ring structure or a substituted or unsubstituted heterocyclic structure, respectively;

wherein l is an integer selected from 1 to 4, n is an integer selected from 1 to 4, and m is an integer selected from 0 to 8; and

wherein when two or more units are present, R, R_1 , R_{1a} , A_1 , l, m and n mean

as above are selected independently for every each unit.

2. (Currently Amended) The polyhydroxyalkanoate according to claim 1 characterized in that the polyhydroxyalkanoate comprises comprising one or more units selected from those represented by the group consisting of chemical formula (2), the chemical formula (3), the chemical formula (4A) or the and chemical formula (4B) in a molecule as a unit of the chemical formula (1)



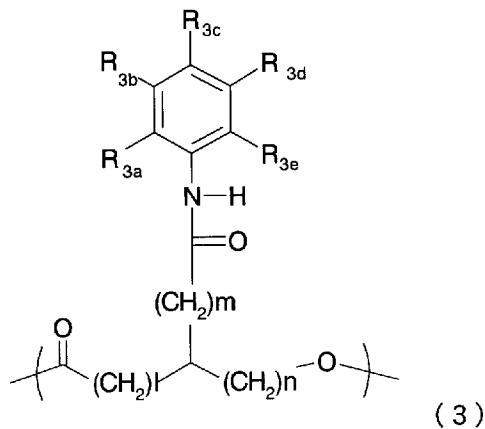
wherein R₂ is selected from the group consisting of OH, a halogen atom, ONa, OK and OR_{2a};

wherein R_{2a} is a linear or branched alkyl group having 1 to 8 carbon atoms or a substituted or unsubstituted phenyl group;

wherein A₂ represents a linear or branched alkylene group having 1 to 8 carbon atoms;

wherein l is an integer selected from 1 to 4, n is an integer selected from 1 to 4 and m is an integer selected from 0 to 8; and

wherein when two or more units are present, A_2 , R_2 , R_{2a} , l , m and n mean as above are independently selected for every each unit[.];

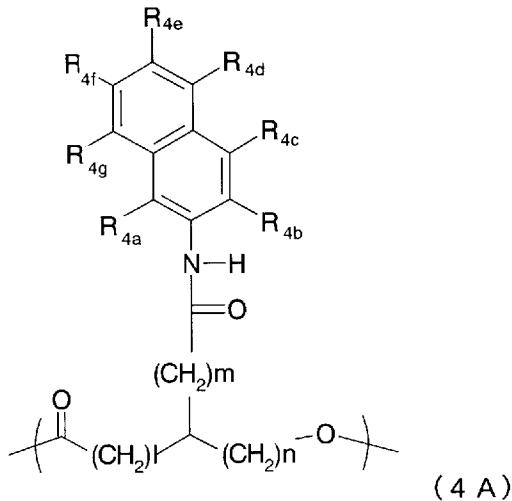


wherein R_{3a} , R_{3b} , R_{3c} , R_{3d} and R_{3e} are, independently, SO_2R_{3f1} wherein R_{3f} is selected from the group consisting of OH, a halogen atom, ONa, OK and OR_{3f1}, wherein OR_{3f1} is a linear or branched alkyl group having 1 to 8 carbon atoms or a substituted or unsubstituted phenyl group; a hydrogen atom, a halogen atom, an alkyl group having 1 to 20 carbon atoms, an alkoxy group having 1 to 20 carbon atoms, an OH-group, NH₂ group, NO₂ group, COOR_{3g} group, wherein R_{3g} represents any of H-atom, Na-atom and K-atom; an acetamide group, OPh-group, NHPh-group, CF₃ group, C₂F₅ group, or C₃F₇ group, wherein Ph represents a phenyl group, respectively, and at least one of R_{3a}, R_{3b}, R_{3c}, R_{3d} and R_{3e} these groups is SO_2R_{3f} ;

wherein l is an integer selected from 1 to 4, n is an integer selected from 1 to 4, and m is an integer selected from 0 to 8; and

wherein when two or more units are present, R_{3a} , R_{3b} , R_{3c} , R_{3d} , R_{3e} , R_{3f} , R_{3f1} ,

R_{3g} , and l, m and n mean as above are independently selected for every each unit;



wherein R_{4a} , R_{4b} , R_{4c} , R_{4d} , R_{4e} , R_{4f} and R_{4g} are, independently, SO_2R_{4o} ,

wherein R_{4o} is selected from the group consisting of OH, a halogen atom, ONa, OK and

OR_{4o1} , wherein OR_{4o1} is a linear or branched alkyl group having 1 to 8 carbon atoms or a

substituted or unsubstituted phenyl group; a hydrogen atom; a halogen atom; an alkyl

group having 1 to 20 carbon atoms; an alkoxy group having 1 to 20 carbon atoms; OH

group; NH_2 group; NO_2 group; $COOR_{4p}$ group, wherein R_{4p} represents any of H atom,

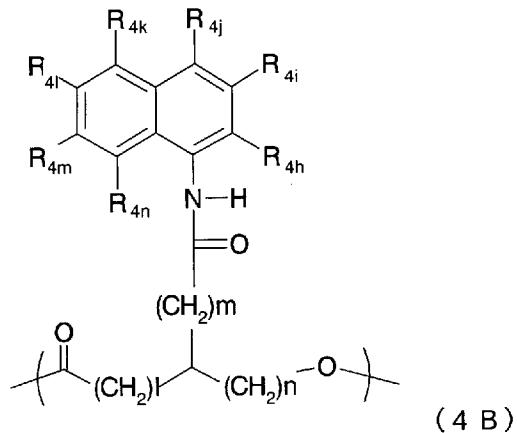
Na atom and K atom; an acetamide group; OPh group; NHPh group; CF_3 group; C_2F_5

group; or C_3F_7 group, wherein Ph represents a phenyl group, respectively; and at least one

of R_{4a} , R_{4b} , R_{4c} , R_{4d} , R_{4e} , R_{4f} and R_{4g} these groups is SO_2R_{4o} ;

wherein l is an integer selected from 1 to 4, n is an integer selected from 1 to 4, and m is an integer selected from 0 to 8; and

wherein when two or more units are present, R_{4a} , R_{4b} , R_{4c} , R_{4d} , R_{4e} , R_{4f} , R_{4g} , R_{4o} , R_{4o1} , R_{4p} , and l , m and n ~~mean as above are~~ independently selected for ~~every~~ each unit;

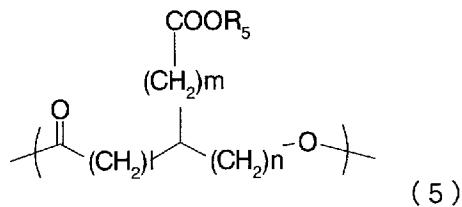


wherein R_{4h} , R_{4i} , R_{4j} , R_{4k} , R_{4l} , R_{4m} and R_{4n} are, independently, SO_2R_{4o} , wherein R_{4o} is selected from the group consisting of OH , a halogen atom, ONa , OK and OR_{4o1} , wherein OR_{4o1} is a linear or branched alkyl group having 1 to 8 carbon atoms or a substituted or unsubstituted phenyl group; a hydrogen atom, a halogen atom, an alkyl group having 1 to 20 carbon atoms, an alkoxy group having 1 to 20 carbon atoms, an OH group, an NH_2 group, a NO_2 group, a COOR_{4p} group, wherein R_{4p} represents any of H -atom, Na -atom and K -atom; an acetamide group, an OPh group, a NPh group, a CF_3 group, a C_2F_5 group, or a C_3F_7 group, wherein Ph represents a phenyl group, respectively, and at least one of R_{4h} , R_{4i} , R_{4j} , R_{4k} , R_{4l} , R_{4m} and R_{4n} ~~these groups~~ is SO_2R_{4o} ;

wherein l is an integer selected from 1 to 4, n is an integer selected from 1 to 4, and m is an integer selected from 0 to 8; and

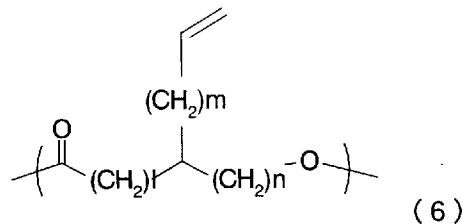
wherein when two or more units are present, R_{4h}, R_{4i}, R_{4j}, R_{4k}, R_{4l}, R_{4m}, R_{4n}, R_{4o}, R_{4o1}, R_{4p}, and l, m and n ~~mean as above are~~ independently selected for every each unit.

3. (Withdrawn) A polyhydroxyalkanoate characterized in that the polyhydroxyalkanoate comprises one or more units represented by the chemical formula (5) in a molecule:



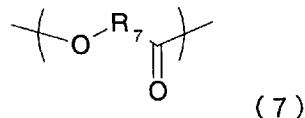
wherein R₅ is hydrogen, a salt forming group or R_{5a}; R_{5a} is a linear or branched alkyl group having 1 to 12 carbon atoms, an aralkyl group or a substituent having a saccharide; l is an integer selected from 1 to 4, n is an integer selected from 1 to 4, m is an integer selected from 0 to 8; and when l is 1, 3 and 4, n is an integer selected from 1 to 4, and m is an integer selected from 0 to 8; and when l is 2 and n is 1, 3 and 4, m is an integer selected from 0 to 8; and when l is 2 and n is 2, m is an integer selected from 1 to 8; and when l is 2, n is 2 and m is 0, R_{5a} is a substituent having a saccharide; and when two or more units are present, R₅, R_{5a}, and l, m and n mean as above independently for every unit.

4. (Withdrawn) A polyhydroxyalkanoate characterized in that the polyhydroxyalkanoate comprises one or more units represented by the chemical formula (6) in a molecule:



wherein l is an integer selected from 1 to 4, n is an integer selected from 1 to 4, and m is an integer selected from 0 to 8; and when two or more units are present, l, m, and n mean as above independently for every unit.

5. (Currently Amended) The polyhydroxyalkanoate according to ~~any one of claims 1 to 4 characterized in that the polyhydroxyalkanoate~~ claim 1 or 2, further ~~comprises~~ comprising one or more units represented by the chemical formula (7) in a molecule:

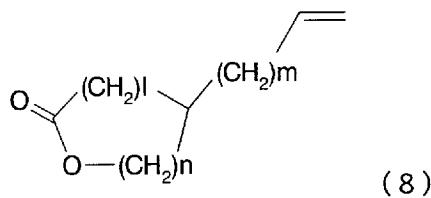


wherein R7 is a linear or branched alkylene group having 1 to 11 carbon atoms, an alkyleneoxyalkylene group, wherein each alkylene group is independently an

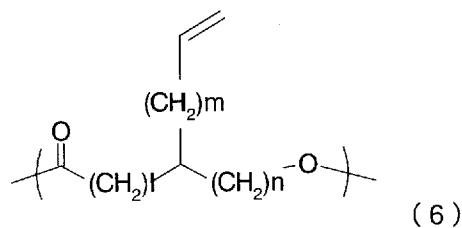
alkylene group having 1 to 2 carbon atoms, respectively, or an alkylidene group having 1 to 5 carbon atoms, which may be substituted with aryl; and

wherein when two or more units are present, R_7 ~~means as above~~is independently selected for everyeach unit.

6. (Withdrawn) A production method of polyhydroxyalkanoate represented by the chemical formula (6) characterized in that the method comprises a step of polymerizing a compound represented by the chemical formula (8) in the presence of a catalyst



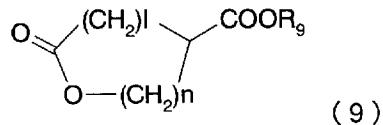
wherein l is an integer selected from 1 to 4, n is an integer selected from 1 to 4, and m is an integer selected from 0 to 8



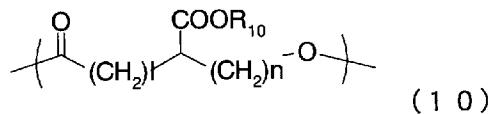
wherein l is an integer selected from 1 to 4, n is an integer selected from 1 to

4, and m is an integer selected from 0 to 8; and when two or more units are present, l, m and n mean as above independently for every unit.

7. (Withdrawn) A production method of polyhydroxyalkanoate represented by the chemical formula (10) characterized in that the method comprises a step of polymerizing a compound represented by the chemical formula (9) in the presence of a catalyst



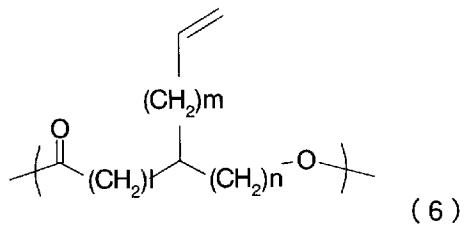
wherein R_9 is a substituent selected from a linear or branched alkyl group having 1 to 12 carbon atoms or an aralkyl group; l is an integer selected from 1 to 4, n is an integer selected from 1 to 4, and when l is 1, 3 or 4, n is an integer selected from 1 to 4, and when l is 2, n is 1, 3 or 4



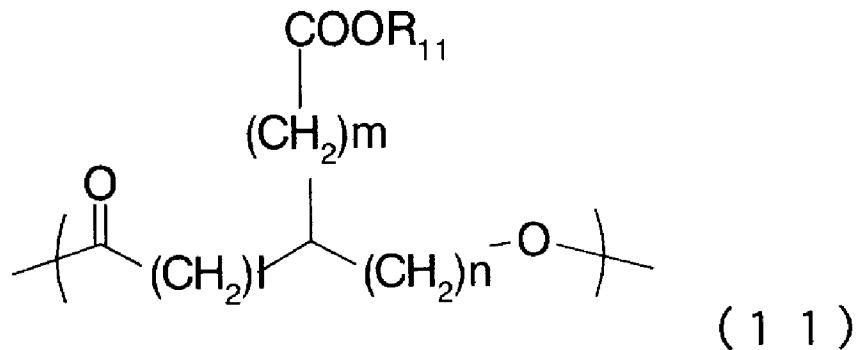
wherein R_{10} is a linear or branched alkyl group having 1 to 12 carbon atoms or an aralkyl group; l is an integer selected from 1 to 4, n is an integer selected from 1 to 4, and when l is 1, 3 or 4, n is an integer selected from 1 to 4, and when l is 2, n is 1, 3 or 4;

and when two or more units are present, l, n and R_{10} mean as above independently for every unit.

8. (Withdrawn) A production method of polyhydroxyalkanoate containing a unit represented by the chemical formula (11) characterized in that the method comprises a step of oxidizing a double bond portion of polyhydroxyalkanoate containing a unit represented by the chemical formula (6):

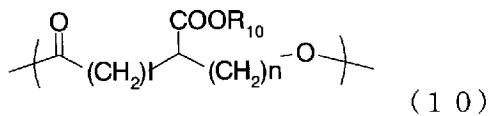


wherein l is an integer selected from 1 to 4, n is an integer selected from 1 to 4, and m is an integer selected from 0 to 8; and when two or more units are present, l, m and n mean as above independently for every unit

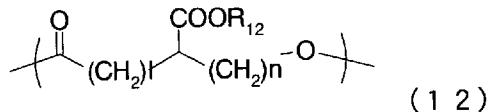


wherein R_{11} is hydrogen or a salt forming group; l is an integer selected from 1 to 4, n is an integer selected from 1 to 4, and m is an integer selected from 0 to 8; and when two or more units are present, l , m , n and R_{11} mean as above independently for every unit.

9. (Withdrawn) A production method of polyhydroxyalkanoate containing a unit represented by the chemical formula (12) characterized in that the method comprises a step of hydrolyzing a polyhydroxyalkanoate containing a unit represented by the chemical formula (10) in the presence of acid or alkali, or subjecting a polyhydroxyalkanoate containing a unit represented by the chemical formula (10) to hydrocracking including catalytic reduction:



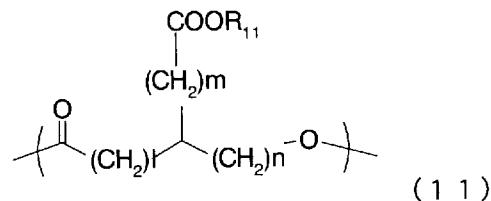
wherein R_{10} is a substituent selected from a linear or branched alkyl group having 1 to 12 carbon atoms or an aralkyl group; l is an integer selected from 1 to 4, n is an integer selected from 1 to 4, and when l is 1, 3 or 4, n is an integer selected from 1 to 4, and when l is 2, n is 1, 3 or 4; and when two or more units are present, l , n and R_{10} mean as above independently for every unit



wherein R_{12} is hydrogen or a salt forming group; l is an integer selected from 1 to 4, n is an integer selected from 1 to 4, and when l is 1, 3, and 4, n is an integer selected from 1 to 4, and when l is 2, n is 1, 3, and 4; and when two or more units are present, l , n and R_{12} mean as above independently for every unit.

10. (Currently Amended) A production method of producing a polyhydroxyalkanoate containing a unit represented by ~~the~~ chemical formula (1), characterized in that ~~the method comprises~~ comprising a step of subjecting a polyhydroxyalkanoate containing a unit represented by ~~the~~ chemical formula (11) and at

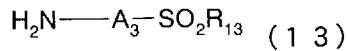
least one amine compound represented by the chemical formula (13) to a condensation reaction:



wherein R_{11} is hydrogen or a salt forming group;

wherein l is an integer selected from 1 to 4, n is an integer selected from 1 to 4, and m is an integer selected from 0 to 8; and

wherein when two or more units are present, l , m , n and R_{11} mean as above are independently selected for every each unit;

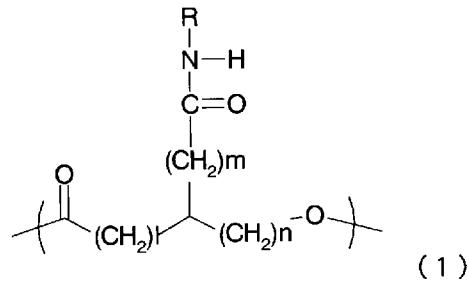


wherein R_{13} is selected from the group consisting of OH, a halogen atom, ONa , OK and OR_{13a} ;

wherein R_{13a} and A_3 are independently selected from a group having a substituted or unsubstituted aliphatic hydrocarbon structure, a substituted or unsubstituted aromatic ring structure or a substituted or unsubstituted heterocyclic structure, respectively; and

wherein when two or more units are present, R_{13} , R_{13a} and A_3 mean as

~~above~~ are independently selected for ~~every~~ each unit;



wherein R represents $-A_1-SO_2R_1$;

wherein R_1 is selected from the group consisting of OH, a halogen atom, ONa, OK and OR_{1a} ;

wherein R_{1a} and A_1 independently represent a group having a substituted or unsubstituted aliphatic hydrocarbon structure, a substituted or unsubstituted aromatic ring structure or a substituted or unsubstituted heterocyclic structure, respectively;

wherein l is an integer selected from 1 to 4, n is an integer selected from 1 to 4, and m is an integer selected from 0 to 8; and

wherein when two or more units are present, R, R_1 , R_{1a} , A_1 , and l, m and n mean as ~~above~~ are independently selected for ~~every~~ each unit.